PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference WO 46098	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/JP2004/018870	International filing date *(day/month/year)* 10.12.2004	Priority date *(day/month/year)* 17.12.2003

International Patent Classification (IPC) or national classification and IPC
C22C9/00, C22C9/06

Applicant
TOYOTA JIDOSHA KABUSHIKI KAISHA et al.

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 2 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12.10.2005	13.03.2006
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Catana, C Telephone No. +49 89 2399-7369

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/018870

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-49	as originally filed
Claims, Numbers	
1-9	received on 01.03.2006 with letter of 01.03.2006
Drawings, Sheets	
1/5-5/5	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☒ the claims, Nos. 10
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

1. The subject-matter of claim 1 is directed to a wear-resistant Cu alloy with hard particles former additions of 2.7-22% of Ta and/or Hf.

2. Reference is made to the following documents:

   D1: EP-A-0727501
   D2: EP-A-1361288

3. Inventive step

3.1 The subject-matter of claim 1 is novel over the disclosure of D1 and/or D2.

D1 mentions the presence of Mo, Ti, Zr, Nb and V (see par. bridging page 5 and 6) as hard particle formers.
D2 mentions the presence of Mo, W and V as silicide formers (see par. 37).

The addition of Ta and/or Hf is not disclosed or taught in any of D1 and/or D2 in combination with the rest of elemental ranges of the wear resistant Cu alloy as to provide the enhancement of wear resistance, lubricity and crack resistance at high temperatures. An inventive step in sense of Art. 33(3) PCT is acknowledged.

3.2 Dependent claims 2-9 fulfill the requirements of patentability according to Art. 33(2) and Art. 33(3) PCT.

Enclosure of January 20, 2006

WO-Patent Application No.: PCT/JP2004/018870
Applicant: TOYOTA JIDOSHA KABUSHIKI KAISHA
Our Ref.: WO 46098

New claims 1 to 9 for Second Auxiliary Request

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1. A wear-resistant copper-based alloy, comprising, by weight, 4.7 to 22.0% nickel, 0.5 to 5.0% silicon, 2.7 to 22.0% iron, 1.0 to 15.0% chromium, 0.01 to 1.97% cobalt, 2.7 to 22.0% of tantalum and/or hafnium, and the balance of copper with inevitable impurities.

2. A wear-resistant copper-based alloy according to claim 1, wherein silicide is dispersed therein.

3. A wear-resistant copper-based alloy according to claim 1 or 2, further comprising a matrix and hard particles dispersed in said matrix,
said matrix having an average hardness of Hv 130 to 250 and said hard particles having a higher average hardness than that of said matrix.

4. A wear-resistant copper-based alloy according to claim 3, wherein said hard particles have an average particle diameter of 5 to 3000 μm.

5. A wear-resistant copper-based alloy according to one of claims 1 to 4, which is used for cladding.

6. A wear-resistant copper-based alloy according to one of claims 1 to 5, which is used for cladding by being melted by a high-density energy beam and then solidified.

7. A wear-resistant copper-based alloy according to one of claims 1 to 6, which constitutes a cladding layer to be clad on a substrate.

8. A wear-resistant copper-based alloy according to one of claims 1 to 7, which is used for a sliding member.

9. A wear-resistant copper-based alloy according to one of claims 1 to 8, which is used for valve train components for an internal combustion engine.

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